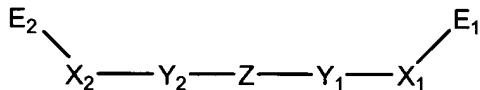


## CLAIMS

What is claimed is:

1        1. An organophotoreceptor comprising an electrically conductive substrate  
2 and a photoconductive element on the electrically conductive substrate, the  
3 photoconductive element comprising:

4        (a) a charge transport material having the formula

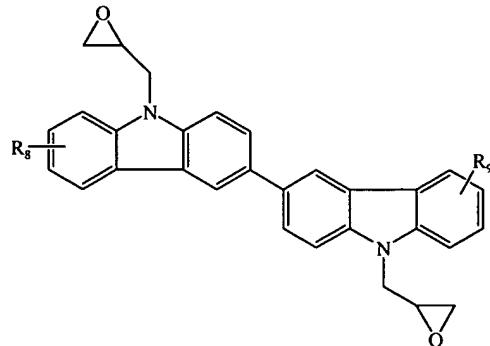


1        2. An organophotoreceptor according to claim 1 wherein  $Z$  is a bond.

1        3. An organophotoreceptor according to claim 1 wherein  $X_1$  and  $X_2$  are, each  
2 independently, a methylene group.

1        4. An organophotoreceptor according to claim 1 wherein  $E_1$  and  $E_2$  are, each  
2 independently, an oxiranyl ring.

1           5. An organophotoreceptor according to claim 1 wherein the charge transport  
2 material is selected from the group consisting of the following formula:



4           where R<sub>8</sub> and R<sub>9</sub> are, each independently, H, hydroxyl, thiol, carboxyl, -  
5 CHO, a keto group, an amino group, cyano, nitro, a halogen, an alkoxy group, an alkyl  
6 group, an alkenyl group, an epoxy group, a thiiranyl group, an aziridino group, a  
7 heterocyclic group, or an aromatic group.

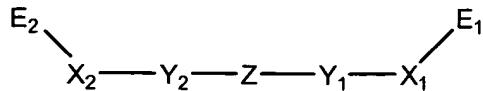
1           6. An organophotoreceptor according to claim 1 wherein the  
2 photoconductive element further comprises a second charge transport material.

1           7. An organophotoreceptor according to claim 6 wherein the second charge  
2 transport material comprises an electron transport compound.

1           8. An organophotoreceptor according to claim 1 wherein the  
2 photoconductive element further comprises a binder.

1           9. An electrophotographic imaging apparatus comprising:  
2           (a) a light imaging component; and  
3           (b) an organophotoreceptor oriented to receive light from the light imaging  
4 component, the organophotoreceptor comprising an electrically conductive substrate and  
5 a photoconductive element on the electrically conductive substrate, the photoconductive  
6 element comprising:

7           (i) a charge transport material having the formula



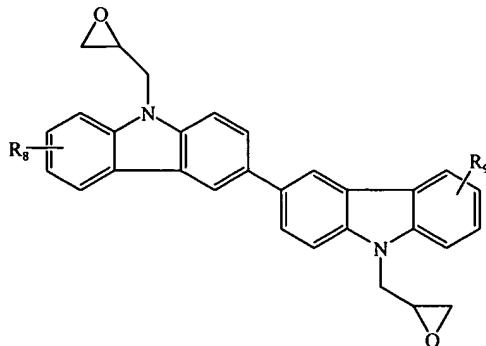
9           where  $Y_1$  and  $Y_2$  comprise, each independently, a carbazolyl group;  
10            $X_1$  and  $X_2$ , each independently, have the formula  $-(CH_2)_m-$ , branched or linear,  
11           where  $m$  is an integer between 0 and 20, inclusive, and one or more of the methylene  
12           groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an  
13           aromatic group, urethane, urea, an ester group, an amide group, an  $NR_3$  group, a  $CR_4$ , or a  
14            $CR_5R_6$  group where  $R_3$ ,  $R_4$ ,  $R_5$ , and  $R_6$  are, independently, a bond, H, hydroxyl, thiol,  
15           carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an  
16           aromatic group, or part of a ring;  
17            $E_1$  and  $E_2$  comprise, each independently, an epoxy group; and  
18           Z is a linking group comprising a bond, a  $-(CR_5=CR_6)_n-$  group, a  $-CR_7=N-$   
19           group, or an aromatic group, where  $R_5$ ,  $R_6$ , and  $R_7$  are, each independently, H, an alkyl  
20           group, an alkenyl group, a heterocyclic group, or an aromatic group, and  $n$  is an integer  
21           between 1 and 10, inclusive; and  
22           (ii) a charge generating compound.

1           10. An electrophotographic imaging apparatus according to claim 9 wherein Z  
2           is a bond.

1           11. An electrophotographic imaging apparatus according to claim 9 wherein  $X_1$   
2           and  $X_2$  are, each independently, a methylene group.

1           12. An electrophotographic imaging apparatus according to claim 9 wherein  
2            $E_1$  and  $E_2$  are, each independently, an oxiranyl ring.

1           13. An electrophotographic imaging apparatus according to claim 9 wherein  
2           the charge transport material is selected from the group consisting of the following  
3           formula:



4

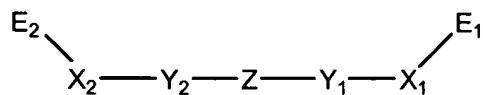
5                   where R<sub>8</sub> and R<sub>9</sub> are, each independently, H, hydroxyl, thiol, carboxyl, -  
6 CHO, a keto group, an amino group, cyano, nitro, a halogen, an alkoxy group, an alkyl  
7 group, an alkenyl group, an epoxy group, a thiranyl group, an aziridino group, a  
8 heterocyclic group, or an aromatic group.

1                   14. An electrophotographic imaging apparatus according to claim 9 wherein  
2 the photoconductive element further comprises a second charge transport material.

1                   15. An electrophotographic imaging apparatus according to claim 14 wherein  
2 second charge transport material comprises an electron transport compound.

1                   16. An electrophotographic imaging apparatus according to claim 9 further  
2 comprising a liquid toner dispenser.

1                   17. An electrophotographic imaging process comprising;  
2                   (a) applying an electrical charge to a surface of an organophotoreceptor  
3 comprising an electrically conductive substrate and a photoconductive element on the  
4 electrically conductive substrate, the photoconductive element comprising  
5                   (i) a charge transport material having the formula



6                   where Y<sub>1</sub> and Y<sub>2</sub> comprise, each independently, a carbazolyl group;  
7                   X<sub>1</sub> and X<sub>2</sub>, each independently, have the formula -(CH<sub>2</sub>)<sub>m</sub>-, branched or linear,  
8 where m is an integer between 0 and 20, inclusive, and one or more of the methylene  
9 groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an

11 aromatic group, urethane, urea, an ester group, an amide group, an NR<sub>3</sub> group, a CR<sub>4</sub>, or a  
12 CR<sub>5</sub>R<sub>6</sub> group where R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> are, independently, a bond, H, hydroxyl, thiol,  
13 carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an  
14 aromatic group, or part of a ring;

15 E<sub>1</sub> and E<sub>2</sub> comprise, each independently, an epoxy group; and

16 Z is a linking group comprising a bond, a -(CR<sub>5</sub>=CR<sub>6</sub>)<sub>n</sub>- group, a -CR<sub>7</sub>=N-  
17 group, or an aromatic group, where R<sub>5</sub>, R<sub>6</sub>, and R<sub>7</sub> are, each independently, H, an alkyl  
18 group, an alkenyl group, a heterocyclic group, or an aromatic group, and n is an integer  
19 between 1 and 10, inclusive; and

20 (ii) a charge generating compound.

21 (b) imagewise exposing the surface of the organophotoreceptor to radiation to  
22 dissipate charge in selected areas and thereby form a pattern of charged and uncharged  
23 areas on the surface;

24 (c) contacting the surface with a toner to create a toned image; and

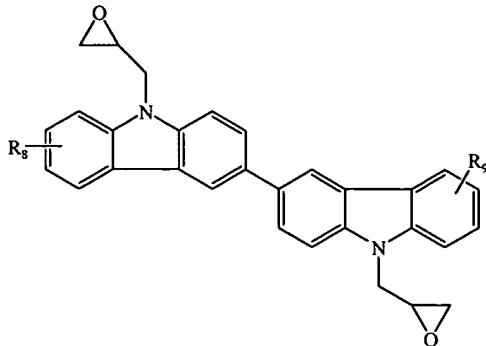
25 (d) transferring the toned image to substrate.

1 18. An electrophotographic imaging process according to claim 17 wherein Z  
2 is a bond.

1 19. An electrophotographic imaging process according to claim 17 wherein X<sub>1</sub>  
2 and X<sub>2</sub> are, each independently, a methylene group.

1 20. An electrophotographic imaging process according to claim 17 wherein E<sub>1</sub>  
2 and E<sub>2</sub> are, each independently, an oxiranyl ring.

1 21. An electrophotographic imaging process according to claim 17 wherein  
2 the charge transport material is selected from the group consisting of the following  
3 formula:



4

5       where R<sub>8</sub> and R<sub>9</sub> are, each independently, H, hydroxyl, thiol, carboxyl, -CHO, a  
6       keto group, an amino group, cyano, nitro, a halogen, an alkoxy group, an alkyl group, an  
7       alkenyl group, an epoxy group, a thiiranyl group, an aziridino group, a heterocyclic group,  
8       or an aromatic group.

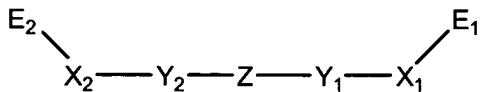
1           22. An electrophotographic imaging process according to claim 17 wherein  
2       the photoconductive element further comprises a second charge transport material.

1           23. An electrophotographic imaging process according to claim 22 wherein  
2       the second charge transport material comprises an electron transport compound.

1           24. An electrophotographic imaging process according to claim 17 wherein  
2       the photoconductive element further comprises a binder.

1           25. An electrophotographic imaging process according to claim 17 wherein  
2       the toner comprises a liquid toner comprising a dispersion of colorant particles in an  
3       organic liquid.

1           26. A charge transport material having the formula



2       where Y<sub>1</sub> and Y<sub>2</sub> comprise, each independently, a carbazolyl group;  
3       X<sub>1</sub> and X<sub>2</sub>, each independently, have the formula -(CH<sub>2</sub>)<sub>m</sub>-, branched or linear,  
4       where m is an integer between 0 and 20, inclusive, and one or more of the methylene  
5       groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an  
6       aromatic group, or an alkenyl group.

7 aromatic group, urethane, urea, an ester group, an amide group, an NR<sub>3</sub> group, a CR<sub>4</sub>, or a  
8 CR<sub>5</sub>R<sub>6</sub> group where R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> are, independently, a bond, H, hydroxyl, thiol,  
9 carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an  
10 aromatic group, or part of a ring;

11 E<sub>1</sub> and E<sub>2</sub> comprise, each independently, an epoxy group; and

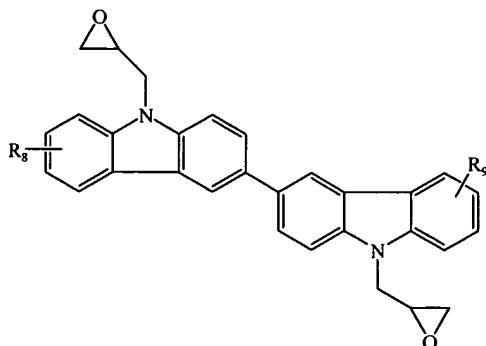
12 Z is a linking group comprising a bond, a -(CR<sub>5</sub>=CR<sub>6</sub>-)<sub>n</sub> group, a -CR<sub>7</sub>=N- group,  
13 or an aromatic group, where R<sub>5</sub>, R<sub>6</sub>, and R<sub>7</sub> are, each independently, H, an alkyl group, an  
14 alkenyl group, a heterocyclic group, or an aromatic group, and n is an integer between 1  
15 and 10, inclusive.

1 27. A charge transport material according to claim 26 wherein Z is a bond.

1 28. A charge transport material according to claim 26 wherein X<sub>1</sub> and X<sub>2</sub> are,  
2 each independently, a methylene group.

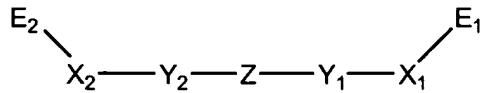
1 29. A charge transport material according to claim 26 wherein E<sub>1</sub> and E<sub>2</sub> are,  
2 each independently, an oxiranyl ring.

1 30. A charge transport material according to claim 26 wherein the charge  
2 transport material is selected from the group consisting of the following formula:



3  
4 where R<sub>8</sub> and R<sub>9</sub> are, each independently, H, hydroxyl, thiol, carboxyl, -  
5 CHO, a keto group, an amino group, cyano, nitro, a halogen, an alkoxy group, an alkyl  
6 group, an alkenyl group, an epoxy group, a thiiranyl group, an aziridino group, a  
7 heterocyclic group, or an aromatic group.

1       31. A polymeric charge transport material prepared by the reaction of a  
2 functional group in a polymeric binder with at least an epoxy group in a compound  
3 having the formula



5       where  $Y_1$  and  $Y_2$  comprise, each independently, a carbazolyl group;

6        $X_1$  and  $X_2$ , each independently, have the formula  $-(CH_2)_m-$ , branched or linear,  
7 where  $m$  is an integer between 0 and 20, inclusive, and one or more of the methylene  
8 groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an  
9 aromatic group, urethane, urea, an ester group, an amide group, an  $NR_3$  group, a  $CR_4$ , or a  
10  $CR_5R_6$  group where  $R_3$ ,  $R_4$ ,  $R_5$ , and  $R_6$  are, independently, a bond, H, hydroxyl, thiol,  
11 carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an  
12 aromatic group, or part of a ring;

13        $E_1$  and  $E_2$  comprise, each independently, an epoxy group; and

14        $Z$  is a linking group comprising a bond, a  $-(CR_5=CR_6)_n-$  group, a  $-CR_7=N-$  group,  
15 or an aromatic group, where  $R_5$ ,  $R_6$ , and  $R_7$  are, each independently, H, an alkyl group, an  
16 alkenyl group, a heterocyclic group, or an aromatic group, and  $n$  is an integer between 1  
17 and 10, inclusive.

1       32. A polymeric charge transport material according to claim 31 wherein the  
2 functional group of the binder is selected from the group consisting of hydroxyl group,  
3 carboxyl group, an amino group, and thiol group.

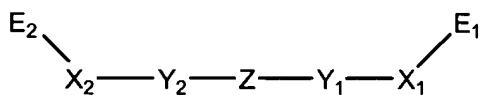
1       33. A polymeric charge transport material according to claim 31 wherein a  
2 crosslinking agent is bonded between the epoxy group and the functional group of the  
3 binder.

1       34. A polymeric charge transport material according to claim 31 wherein  $Z$  is  
2 a bond.

1           35. A polymeric charge transport material according to claim 31 wherein E<sub>1</sub>  
2 and E<sub>2</sub> are, each independently, an oxiranyl ring.

1           36. An organophotoreceptor comprising an electrically conductive substrate  
2 and a photoconductive element on the electrically conductive substrate, the  
3 photoconductive element comprising:

4           (a) a polymeric charge transport compound prepared by the reaction of a  
5 functional group in a polymeric binder with at least an epoxy group in a compound  
6 having the formula



7           where Y<sub>1</sub> and Y<sub>2</sub> comprise, each independently, a carbazolyl group;

8           X<sub>1</sub> and X<sub>2</sub>, each independently, have the formula -(CH<sub>2</sub>)<sub>m</sub>-, branched or linear,  
9 where m is an integer between 0 and 20, inclusive, and one or more of the methylene  
10 groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an  
11 aromatic group, urethane, urea, an ester group, an amide group, an NR<sub>3</sub> group, a CR<sub>4</sub>, or a  
12 CR<sub>5</sub>R<sub>6</sub> group where R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> are, independently, a bond, H, hydroxyl, thiol,  
13 carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an  
14 aromatic group, or part of a ring;

15           E<sub>1</sub> and E<sub>2</sub> comprise, each independently, an epoxy group; and

16           Z is a linking group comprising a bond, a -(CR<sub>5</sub>=CR<sub>6</sub>)<sub>n</sub>- group, a -CR<sub>7</sub>=N-  
17 group, or an aromatic group, where R<sub>5</sub>, R<sub>6</sub>, and R<sub>7</sub> are, each independently, H, an alkyl  
18 group, an alkenyl group, a heterocyclic group, or an aromatic group, and n is an integer  
19 between 1 and 10, inclusive; and

20           (b) a charge generating compound.

1           37. An organophotoreceptor according to claim 36 wherein the  
2 photoconductive element further comprises a charge transport material.

1           38. An organophotoreceptor according to claim 37 wherein the charge  
2 transport material comprises an electron transport compound.

1           39. An organophotoreceptor according to claim 36 wherein the functional  
2 group of the binder is selected from the group consisting of hydroxyl group, carboxyl  
3 group, an amino group, and thiol group.

1           40. An organophotoreceptor according to claim 36 wherein Z is a bond.

1           41. An organophotoreceptor according to claim 36 wherein E<sub>1</sub> and E<sub>2</sub> are,  
2 each independently, an oxiranyl group.